Eduscape : Journal of Education Insight
E-ISSN : 3026-5231
Volume. 2 Issue 2 April 2024
Page No: 111-123

Analysis Of Problem-Solving Skills Related To Building Space Material In Students At Smp Negeri 2 Galesong Selatan

Ari Wibowo[1], Marilyn Lasarus[2]
Universitas Sawerigading Makassar, Indonesia[1]
Universitas Kristen Indonesia Toraja, Indonesia[2]
Correspondent: arhyhikmal88@gmail.com [1]

Received : January 19, 2024
Accepted : February 03, 2024
Published : April 30, 2024

Citation: Wibowo, A., & Lasarus, M. (2024). Analysis Of Problem-Solving Skills Related To Building Space Material In Students At Smp Negeri 2 Galesong Selatan. Eduscape : Journal of Education Insight, 2(2), 111-123. https://doi.org/10.61978/eduscape.v2i2

ABSTRACT: This study aims to describe how students' problem-solving abilities use Polya stages in completing space building material. The research method is descriptive qualitative. The subjects of this study were taken by 3 students from 27 students of grade VIII.f SMP Negeri 2 Galesong Selatan. Based on the results of the study, it can be concluded that the ability to solve mathematical problems to solve the material to build space with the Polya stage is a high-ability student, that is, students are able to meet the problem-solving indicators even though there are some indicators that are not written down but can be explained at the interview, and it does not mean that students are not able to solve the problem. It's just that students don't want to be complicated and rewrite which in the end is rewritten in the next indicator. Students with moderate ability, namely students are able to meet the indicators of problem solving, but there are some students who misunderstand the concept of solving problems, because they do not match what is planned with what is written in solving problems because students are in a hurry to solve problems. Low-ability students, namely students are only able to meet 2 indicators because they do not understand the plan to be used in solving the problem.
Keywords: Problem-solving ability, Mathematic error, Polya step.

INTRODUCTION

Education is an essential social activity or process that allows the younger generation to exist in social complexity, economic modernization, and scientific and technological advancement. This important role lies not only in the use of mathematical formulas or in the accuracy of calculations, but lies in mathematical logic. In addition, mathematics also plays an important role in real life. The importance of mathematics in real life makes mathematics one of the subjects that must be taught at every level of education, from elementary school to tertiary education. The importance of problem-solving skills in mathematics learning is listed in the learning objectives of mathematics itself(Masrukan, 2014; Wibowo, 2019). This is in line with the objectives of mathematics learning activities in schools contained in the Regulation of the Minister of National Education No. 22 of

2006, one of the goals is to solve problems including how students understand problems, plan or design mathematical approaches, complete approaches that have been made, and reinterpret the results that have been obtained(Lasarus et al., 2023; Rifa'i & Anni, 2011). Based on the results of an interview with one of the mathematics teachers at SMP Negeri 2 Galesong Selatan on Monday, September 5, 2022, it was found that the understanding of the concept of math problems was good, even though when students were given problem-solving problems they had difficulties(kusumadewi et al., 2022; N.C.T.M., 2000). In addition, students also find it difficult to determine the algorithm when answering questions, so students tend to use formulas or methods that are commonly used rather than using procedural steps from solving these math problems(Nadiatul, 2018). For example, in the material, surface area and volume of cubes and blocks, students prefer to directly use formulas rather than look at the flat side space using the nets. This aims to facilitate students' understanding of the subject matter obtained as well as supporting media, ways or techniques to make students more active and independent. Therefore, so that mastery and solving problem-based mathematical problems, especially in building space material, can increase(Andayani & Lathifah, 2019; Yuwono et al., 2018). In addition, the use of objects in everyday life that has not been maximized is also a factor that causes students to be less familiar with the material taught. The focus of this research is to analyze solving abilities students' mathematics problems in learning(Utami & Wutsqa, 2017; Wibowo & dkk, 2022). In this research that will be analyzed, namely students' mathematical problem solving abilities based on Polya stages(Hikmal, 2023; Laine et al., 2012). The problem solving stages proposed by Polya, namely: (1) understanding the problem; (2) planning problem solving; (3) carrying out problem solving; (4) check again(Kartina, 2021; Tommy, 2018).

Based on the description above, the problem formulation is formulated in this research are How do students' problem solving abilities relate to building materials? space based on problem solving indicators from polya(Marliani, 2015; Nurfaizah et al., 2020).

METHOD

The type of research used is descriptive research using a qualitative approach that aims to describe how students' problem-solving abilities use Polya stages in completing spatial building material. The subjects in this study were grade VIII.f students of SMP Negeri 2 Galesong Selatan with a total of 27 students. The subjects in this study were only 3 students with random research. In qualitative research, the instrument or research tool is the researcher himself. Researchers become human instruments that function to determine the focus of research, choose informants as data sources, collect data, assess data quality, analyze data, interpret data and make conclusions on everything. So in this study, the researcher becomes the research instrument itself, besides that the instruments used are test instrument sheets, interview guidelines and documentation(Bernard et al., 2018).

RESULT AND DISCUSSION

In this study after determining the subject, to make it easier for researchers to analyze the interview data of each subject, the researcher provides coding. The subject coding is as follows:

No	Type Categori	Code of Subjek
1	High	MAA
2	Middle	CAM
3	Low	ECA

a. Description of High category MAA Subject Problem Solving Ability

Analysis of question number 1

Memahami masalah(Masrurotullaily et al., 2013; Nadhifa et al., 2019) :
Diketahui : Sisi (S) = 60 CM
Ditanyakan : Maksimal vol bak mandi

Merencanakan pemecahan masalah :
Akan dicari : volume kubus

Melaksanakan pemecahan masalah :
Maksimal Volume Kubus: S x S x S
: 60 x 60 x 60
: 216.000 cm^3

Memeriksa Kembali :
Jadi Vol maksimal bak mandi adalah 216.000 cm^3

Based on figure states that the subject is able to solve problems in the problem with Polya stages, namely understanding the problem, planning problem solving, carrying out problem solving and re-examining(Suyitno et al., 2000; Tanjung, 2021). This can be seen on the answer sheet which lists all the steps according to the procedure. However, in checking again, writing the rupiah is not quite right. Furthermore, to strengthen the problem-solving ability data, triangulation of problem-solving ability test result data is carried out by interviewing the right subject. Here are the subject interviews by researchers:

MH : Assalamu 'Alaikum Dek
MAA : Wa'alaikum greetings Kak
MH : What do you understand about this?
MAA : From the questions I read, it is known that the side is 60 cm.
MH : What's next to ask about the question?
MAA : Asked what is the maximum volume of the Dzaki kak bathtub
MH : Is there any connection between the two?
MAA : Yes there is
MH : Then what are your next plans?
MAA : The plan is to ask the maximum volume means using the cube volume formula
MH : Try to explain the process deck
MAA : Cube volume = s x s x s = 60 x 60 x 60 = 216,000 cm3
MH : Does adek re-examine the results of the work being processed

MAA : Yes
MH : So are the conclusions that you wrote appropriate?
MAA : Not appropriate because the writing of the rupiah is not right because it is rushed, but I understand you

Based on the data of the results of the problem-solving ability test and interview, it can be seen that the MAA subject is able to complete according to the problem-solving ability measures. However, at the stage of re-examining there was a mistake in writing the rupiah because it was not careful.

b. Description of Medium category CAM Subject Troubleshooting Ability

Analysis of question number 3

Memahami masalah(Broto, 2019) :
Diketahui Panjang sisi (S) = 16 cm
Ditanyakan : Luas kertas kado

Merencanakan pemecahan masalah :
Akan di cari = luas permukaan kubus

Melaksanakan pemecahan masalah :
Luas permukaan kubus = 6 x sisi x sisi
= 6 x 16 x 16
= 1.536 x 5
= 7.680 cm^2

Based on figure states that the subject is able to solve problems in the Polya stage, namely understanding the problem, planning problem solving, and carrying out problem solving(Samad, 2021). This can be seen on the answer sheet in understanding the subject problem, not writing down some of what is known, namely the number of gifts that will be wrapped in Agung and not writing down the final conclusion that has been obtained. Furthermore, to strengthen the problem-solving ability data, triangulation of problem-solving ability test result data is carried out by interviewing the right subject(Chacón-Castro et al., 2023). Here are the subject interviews by researchers:

MH : Right off the bat, what is known about the problem?
CAM : Side length(s) = 16 cm sis, many gifts will be wrapped = 5 gifts
MH : So what is asked about the deck?
CAM : The area of wrapping paper needed by Agung
MH : Try to explain the process!
CAM : The first step we solve first is the surface area of the cube = 6 x s x s = 6 x 16 cm x 16 cm = 1536 cm2. The second step of the surface area result that we get in times 5 because Agung will wrap 5 gifts that is 1,536 cm2 x 5 = 7,680 cm2.
MH : Good means you can complete it according to the steps
CAM : Yes
MH : What are the obstacles in that problem?
CAM : At first I was mistaken for a lot of gifts that would be wrapped in Agung,

but luckily I remember it was similar to last week's training so I could doit.
MH : Did you check the answers you got?
CAM : Yes, sis, the area of the grand wrapping paper is 7,680 cm2

Based on the data of the problem-solving ability test and interview, it can be seen that the MAA subject is able to complete according to the problem-solving ability measures. In this case, the subject is able to understand at the stage of understanding the problem but does not write it down on the answer sheet as presented in the interview(Christina, 2021).

c. Description of Low Category ECA Subject Troubleshooting Capabilities

Analysis of question number 1

Memahami masalah(Parulian et al., 2020) :
Dik = (S) =60cm
Dit = volume bak mandi

Melaksanakan pemecahan masalah :
Penyelesaian = Volume bak mandi Dzaki
= s x s x x
= 60 x 60 60
= 220 x 60
= 1.300.000

Based on figure states that the subject has not been able to solve the problem with the Polya stage. This can be seen on the subject's answer sheet at the stage of understanding the problem he writes about what is known and asked, at the stage of planning problem solving the subject does not write the formula to be used, making it difficult to carry out the problem solving as in the wrong answer sheet in his calculations(Depdiknas, 2006; Harry et al., 2018). Then at the stage of re-examining the subject did not check the results of the completion. Furthermore, to strengthen the problem-solving ability data, triangulation of problem-solving ability test result data is carried out by interviewing the right subject. Here are the subject interviews by researchers:

MH : Do you understand that?
ECA : Yes, you understand
MH : What is known about the deck?
ECA : Side = 60 cm
MH : Then what is asked from the deck question
ECA : Dzaki kak bathtub volume
MH : What information did you get
ECA : Dzaki will hold water in a bathtub with sides of 60 cm.
MH : Then what plan or steps did you use in solving the problem?
ECA : Don't know how to determine it
MH : Well, how is the process of solving problems that you understand
ECA : Dzaki bathtub volume = s x s x s = 60 x 60 x 60 = 216,000 cm3.
MH : Is the answer correct
ECA : Yes

MH : Which answer do you think is appropriate, is it written or delivered?
ECA : What was conveyed in the interview kak
MH : Pay more attention to the deck in solving problems
ECA : Yes
MH : Did you recheck the answer after doing it?
ECA : No kak

Based on the data of the problem-solving ability test and interview, it can be seen that the ECA subject has not been able to complete according to the problem-solving ability measures, because the subject did not write down the stage of planning and re-checking to see the answer. In this case the subject does not solve it correctly.

Drawing Conclusions of Category Subjects

a. **Drawing Conclusions of MAA High Category Subjects**

Based on the results of ability tests and interviews on high category subjects with question number 1 able to meet all indicators of mathematical problem solving, namely (1) understanding the problem, (2) planning troubleshooting, (3) performing troubleshooting, (4) checking back(Rambe & Afri, 2020). In question number 2 the subject is only able to meet 3 indicators of mathematical problem solving, namely (1) understanding the problem, (2) carrying out problem solving, (3) re-examining. Furthermore, in question number 3 the subject is able to meet all mathematical problem solving indicators, namely (1) understanding the problem, (2) planning problem solving, (3) carrying out problem solving, (4) re-examining(Nafisah et al., 2022; Risnawati et al., 2019). Then in question number 4 the subject is able to meet all indicators of mathematical problem solving, namely (1) understanding the problem, (2) planning problem solving, (3) carrying out problem solving, (4) re-examining. And in question number 5 the subject is able to meet all indicators of mathematical problem solving, namely (1) understanding the problem, (2) planning problem solving, (3) carrying out problem solving, (4) re-examining(Yang et al., 2021).

Table Achievement of MAA High Category Subject Indicator

Question Point	Mathematical Troubleshooting Indicators			
	Understanding the Problem	Plan for Troubleshooting	Carry out troubleshooting	Checking Back
Question number 1	✓	✓	✓	✓
Question number 2	✓	-	✓	✓
Question number 3	✓	✓	✓	✓
Question number 4	✓	✓	✓	-
Question number 5	✓	✓	✓	✓

b. Drawing Conclusions of Medium Category Subject CAM

Based on the results of ability tests and interviews in medium category subjects with question number 1 able to meet all indicators of mathematical problem solving, namely (1) understanding the problem, (2) planning problem solving, (3) carrying out problem solving, (4) re-examining(Rahmawati et al., 2021). In question number 2 the subject is able to meet mathematical problem solving indicators, namely (1) understanding the problem, (2) planning problem solving, (3) carrying out problem solving, (3) re-examining. Furthermore, in question number 3 the subject is able to meet all mathematical problem solving indicators, namely (1) understanding the problem, (2) planning problem solving, (3) carrying out problem solving, (4) re-examining(Rahmat et al., 2022). Then in question number 4 the subject is able to meet all indicators of mathematical problem solving, namely (1) understanding the problem, (2) plan problem solving, (3) implement problem solving, (4) re-examin. And in question number 5 the subject is able to meet all indicators of mathematical problem solving, namely (1) understanding the problem, (2) plan problem solving, (3) implement problem solving, (4) re-examin.

Table Achievement of Medium Category Subject Indicator

Question Point	Mathematical Troubleshooting Indicators			
	Understand the problem	Plan for Troubleshooting	Carry out troubleshooting	Checking back
Question Number 1	✓	✓	✓	✓
Question Number 2	✓	✓	✓	✓
Question Number 3	✓	✓	✓	✓
Question Number 4	✓	✓	✓	✓
Question Number 5	✓	✓	✓	✓

c. Drawing Conclusions of ECA Low Category Subjects

Based on the results of ability tests and interviews in low category subjects with question number 1, subjects meet 2 indicators of mathematical problem solving, namely (1) understanding the problem, (2) carrying out problem solving. In question number 2 the subject meets 2 indicators of mathematical problem solving, namely (1) understanding the problem, (2) carrying out problem solving. Furthermore, in question number 3 the subject meets 2 indicators of mathematical problem solving, namely (1) understanding the problem, (2) carrying out problem solving. Then in question number 4 the subject meets 3 mathematical problem solving indicators, namely (1) understanding the problem, (2) planning problem solving, (3) carrying out problem solving. And in question number 5 the subject is able to meet 2 indicators of mathematical problem solving, namely (1) understanding the problem, (2) carrying out problem solving.

Table Achievement of Low Category Subject Indicator

Question Point	Mathematical Troubleshooting Indicators			
	Understand the problem	Plan for Troubleshooting	Carry out troubleshooting	Checking back
Question Number 1	✓	-	✓	-
Question Number 2	✓	-	✓	-
Question Number 3	✓	-	✓	-
Question Number 4	✓	✓	✓	-
Question Number 5	✓	-	✓	-

Table Triangulation Results for High, Medium and Low Category Subjects

Question	Problem Solving Ability Test Results Indicator				Interview Test Results on Subjects
	Understanding the Problem	Plan for Troubleshooting	Carry out troubleshooting	Checking Back	
MAA High Category Subjects	The subject is able towrite down what isk nown and aske d correctly.	The subject is able to write down the plan or steps used in solving the question on the answer sheet	The subject is able to write the problem solving according to the steps correctly	The subject is capable of Write down conclusions end	The subject is able to understand, plan, implement and be able to explain back the final conclusion.
Medium Category Subject C AM	The subject is able to write downwhat infor mation is known and askedcorrec tly.	The subject is able to writedown the plan or steps use d in solving the question on the answer sheet	Subject Write the problem solving according to the steps, but the formula writing is not as asked but the process is correct	The subject is able to write Final conclusions accordingly What is asked from the question.	The subject is able to understand, plan, implement and be able to explain the final conclusion, even though on the answer sheet there are still writing errors
ECA low category subjects	The subject is able to write downwhat is kn own and asked c orrectly	The subject is able to writedown the plan or steps use d in solving the question on the answer sheet	The subject is able to write the problem solution according to the steps, it's just thatthe solution is not right	The subject did not write thefinal conclu sion according to what was asked from the question.	The subject is able to understand, plan, and execute but the subject cannot re-explain the final conclusion

Based on the research results in the table above, the results of mathematical problem solving ability tests and interviews on selected subjects were obtained. The results of data acquisition and analysis

were obtained based on Polya's stage theory with subjects in the high, medium and low categories, subjects in the high Based on the results of ability tests and interviews during the research, it can be described that the subject is able to fulfill the indicators of problem-solving ability, namely (1) the stage of understanding the problem well, as seen from the subject's answers, being able to write down what is known and what is asked correctly and explain in his own words(Ellycia & Alpha, 2021; Hidayat et al., 2022). Subjects in the medium categories, It can be described that the subject is able to fulfill the indicators of problem solving ability, namely (1) the stage of understanding the problem well, as seen from the subject's answer being able to write down what information is known and what is asked correctly and explain it in his own words. Subjects in the low categories, It can be described that the subject is only able to fulfill 2 indicators of problem solving ability, namely (1) the stage of understanding the problem, which can be seen from the answer sheet. The subject is able to write down what is known and what is asked. MAA subjects entered the high category of mathematical problem-solving skills because all met the problem-solving indicators based on polya stages with explanations on the problem, even though the subjects did not write down some problem-solving plans and final conclusions It's not that the subject is unable to solve the problem, but the subject doesn't want to be complicated, doesn't want to rewrite the result that will still be the same and according to him it takes a lot of time to solve the problem.

CAM subjects enter the medium category mathematical problem solving ability because there are some problems that do not meet the problem solving indicators based on polya stages with explanations of not being able to transfer from what is asked to carry out the solution Problems so that in the process of operation there are errors, do not understand the difference in how to determine between volume and area ECA subjects are in the low category of mathematical problem solving abilities , because they only meet 2 problem solving indicators based on polya stages with explanations are not able to determine the plan or steps that will be used to solve the problem and also the subject Unable to implement the solution in concluding the correct answer.

CONCLUSION

Based on the results of the research and data analysis obtained, the researcher concluded that the ability to solve mathematical problems of grade VIII.f students with Polya stages as follows:

High-ability students

High ability students are able to meet all indicators of problem solving ability, namely (1) the stage of understanding the problem well, (2) the stage of planning problem solving correctly, although there are some numbers that are not written down but can be explained at the interview. (3) the stage of carrying out the problem solving correctly and structured, and (4) the stage of re-examining by looking at and making the final conclusions he has obtained.
So it can be said that the subject of MAA entered the high category of mathematical problem solving ability because all met the indicators of problem solving based on the polya stage with

explanations on the problem, even though the subject did not write some problem-solving plans and the final conclusion does not mean the subject was unable to solve the problem, but the subject did not want to be complicated, did not want to rewrite the results that would still be the same and according to him it took a lot of time to solve the problem.

Moderately capable students

Moderate ability students are able to meet the indicators of problem solving ability, namely (1) the stage of understanding the problem well, but there is 1 number that does not write down some of what is known, (2) the stage of planning problem solving correctly, (3) the stage of carrying out problem solving is not right because some do not match what is asked with the steps of solving the problem, so they experience errors in solving the problem, and (4) the stage of re-examining the subject makes conclusions, but some problems do not write them down.
So it can be said that the subject of CAM is in the medium category of mathematical problem solving ability because there are some problems that do not meet the problem solving indicators based on the polya stage with explanations of not being able to transfer from what is asked to carry out problem solving so that in the process of operation there are errors, do not understand the difference in how to determine between volume and area. And in question number 3 the subject did not write down the final conclusion of the answer that had been obtained.

Low ability students

Low ability students are only able to achieve 2 indicators of problem solving ability, namely understanding problems and carrying out problem solving, even though the solution is still not right. So it can be said that ECA subjects enter the low category of mathematical problem solving abilities, because they only meet 2 indicators of problem solving based on polya stages with explanations are unable to determine plans or steps to be used to solve problems, lack of understanding of problems and also subjects are unable to implement solutions in concluding correct answers.

High-ability students are students who are able to meet problem-solving indicators even though there are some indicators that are not written down but can be explained at the interview, and it does not mean that students are not able to solve problems. It's just that students don't want to be complicated and rewrite which in the end is rewritten in the next indicator. Students with moderate ability, namely students are able to meet the indicators of problem solving, but there are some students who misunderstand the concept of solving problems, because they do not match what is planned with what is written in carrying out problem solving because students are in a hurry to solve problems. Low-ability students, namely students are only able to meet 2 indicators because they do not understand the plan to be used in solving the problem.

REFERENCE

Andayani, F., & Lathifah, A. N. (2019). Analysis of problem solving abilities of junior high school students in solving problems on social arithmetic material. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *3*(1), 1–10.

Bernard, M., Nurmala, N., Mariam, S., & Rustyani, N. (2018). Analysis of mathematical problem solving abilities of class IX junior high school students on flat shapes material. *SJME (Supremum Journal of Mathematics Education*, *2*(2), 77–83.

Broto, A. (2019). Analysis of Student Errors in Solving Algebraic Function Derivative Problems. *Jurnal Komunikasi Pendidikan*, *3*, 117–125.

Chacón-Castro, M., Buele, J., López-Rueda, A. D., & Jadán-Guerrero, J. (2023). Pólya's Methodology for Strengthening Problem-Solving Skills in Differential Equations: A Case Study in Colombia. *Computers*, *12*(11), 239.

Christina, E. N. (2021). Analysis of polya stage problem solving abilities in solving linear equations and inequalities in one variable. *JPMI (Jurnal Pembelajaran Matematika Inovatif*, *4*(2), 405–424.

Depdiknas. (2006). *Permendiknas No 22 Tahun 2006 Tentang Standar Isi*. Depdiknas.

Ellycia, N. C., & Alpha, G. A. (2021). Analysis of Polya Stage Problem Solving Ability in Solving Linear Equations and Inequalities in One Variable. *Jurnal Pembelajaran Matematika Inovatif*, 405–424.

Harry, D. P., Nazmy, F. T., Mentari, G., & Dede, N. (2018). Middle School Students' Mathematical Problem Solving Ability on Spatial Building Material. *Jurnal Ilmiah Pendidikan Matematika*, *6*, 82–90. http://journal.inipma.ac.id/index.php/jipm

Hidayat, R., Siregar, E. Y., & Elindra, R. (2022). Analysis of the Factors of the Low Mathematical Problem Solving Ability of Students at the Private Vocational School Teruna Padangsidimpuan. *JURNAL MathEdu (Mathematic Education Journal*, *5*(3), 114–120.

Hikmal, A. W. (2023). Improving Novick's Constructivist Learning Model Through the Ability to Solve Arithmetic Problems. *Sigma: Jurnal Pembelajaran dan Pendidikan Matematika Sawerigading*, *2*(1), 1–11.

Kartina, t. (2021). *Pengaruh Model Pembelajaran problem Based Learning Terhadap Kemampuan Pemecahan Masalah Matematika pada pokok Bahasan Balok di kelas SMP Negeri 2 Sampean Sungai Kanan* (pp. 1–129).

kusumadewi, N., dkk, & G. (2022). Development of digital mathematics comic media for learning fractions in elementary schools". *Jurnal Ilmiah Pendidikan Citra Bakti*, *9*(1), 103–116. https://doi.org/10.38048/jipcb.v9i1.660Polya

Laine, A., Näveri, L., Pehkonen, E., Ahtee, M., Heinilä, L., & Hannula, M. S. (2012). Third-graders' problem solving performance and teachers' actions. *ProMath 2011 Conference*, 69–81.

Lasarus, M., Wibowo, A., & Angela, A. (2023). Identification of Geometric Concepts Contained in The Pa'binti'Weaving Crafts of The Toraja Society. *Edumaspul: Jurnal Pendidikan*, *7*(1), 82–91.

Marliani, N. (2015). Mathematical problem solving abilities in differential equations courses are seen from cognitive conflict learning which is integrated with soft skills. *Formatif: Jurnal Ilmiah Pendidikan MIPA*, *5*(2).

Masrukan. (2014). *Authentic Assessment of Mathematics Learning*. CV. Swadaya Manunggal.

Masrurotullaily, M., Hobri, H., & Suharto, S. (2013). Analysis of financial mathematics problem solving abilities based on the Polya model of students at SMK Negeri 6 Jember. *Kadikma*, *4*(2).

Nadhifa, N., Maimunah, M., & Roza, Y. (2019). Analisis kemampuan pemecahan masalah siswa pada materi bangun ruang sisi datar. *Numerical: Jurnal Matematika Dan Pendidikan Matematika*, 63–76.

Nadiatul, k. (2018). *Class VII Students' Mathematical Problem Solving Ability in the Problem Based Learning Model with a Realistic Approach to Building Materials* (pp. 2–9).

Nafisah, K., Turmuzi, M., Triutami, T. W., & Azmi, S. (2022). Analysis of mathematical problem solving abilities in flat-sided geometric material based on students' initial mathematical abilities. *Griya Journal of Mathematics Education and Application*, *2*(3), 719–731.

N.C.T.M. (2000). Principles and Standards for School Mathematics Overview. *Journal of Equine Veterinary Science*.

Nurfaizah, A. P., A, N., & D.J. (2020). Increasing the competency of elementary school teachers in developing digital teaching materials in Gowa Regency. *Journal of Educational Publications*, *10*(3), 266–270.

Parulian, R. A., Munandar, D. R., & Ruli, R. M. (2020). Analisis kemampuan pemecahan masalah matematis dalam menyelesaikan materi bilangan bulat pada siswa SMP. *Prosiding Sesiomadika*, *2*(1a).

Rahmat, H., Eva, Y. S., & Rahmatika, E. (2022). Analysis of the Factors of the Low Mathematical Problem Solving Ability of Students at the Padangsidimpuan Taruna Private Vocational School. *Jurnal MathEdu (Mathematic Education Journal*, *5*, 114–120. http://journal.ipts.ac.id/index.php/MathEdu

Rahmawati, A., Lukman, H. S., & Setiani, A. (2021). Analysis of Mathematical Problem Solving Ability in View from the Level of Self-Efficacy. *EQUALS: Jurnal Ilmiah Pendidikan Matematika*, *4*(2), 79–90.

Rambe, A. Y. F., & Afri, L. D. (2020). Analysis of students' mathematical problem solving abilities in solving sequence and series material problems. *AXIOM: Jurnal Pendidikan Dan Matematika*, *9*(2), 175–187.

Rifa'i, A., & Anni, C. T. (2011). *Educational Psychology*. Pusat Pengembangan MKU/MKDK-LP3 Universitas Negeri Semarang.

Risnawati, R., Wibowo, A., & Bahar, B. (2019). Analysis of students' problem solving abilities on flat-sided geometric material di Kabupaten Gowa. *Pepatudzu: Media Pendidikan Dan Sosial Kemasyarakatan*, *15*(2), 118–126.

Samad, I. dan A. M. P. (2021). The influence of mathematical reasoning abilities using the double loop problem solving learning model on student learning outcomes". *Indonesian Journal Of educational Sciences*, *IJES), vol 4*. https://doi.org/10.31605/ijes.v4i1.1202Sugiyono.

Suyitno, A., Hidayah, I., & Suhito. (2000). *Basics and Process of Learning Mathematics I*. Universitas Negeri Semarang.

Tanjung, K. (2021). *The influence of the problem based learning model on problem solving abilities on the subject of blocks in Class VIII of SMP N 2 Sampean Sungai Kanan*.

Tommy, t. (2018). neng, s. *s*, *6*(r. f., M.Afrilianti), 19–28. w.,

Utami, R. W., & Wutsqa, D. U. (2017). Analysis of mathematical problem solving abilities and self-efficacy of state junior high school students in Ciamis Regency. *Jurnal Riset Pendidikan Matematika*, *4*(2), 166–175.

Wibowo, A. (2019). Improving the mathematics learning outcomes of fifth grade students at SD Inpres Batua II, Makassar, through the implementation of numbered heads together type cooperative learning. *Jurnal Pendidikan PEPATUDZU*, *15*(1).

Wibowo, A., & dkk. (2022). Analysis Of Students. In *Critical Thinking Ability In Solving Mathematics Problems In Class XI AKL 1 SMK Negeri 4 Makassar". Daya Matematis, Jurnal Inovasi Pendidikan Matematika, Vol.10 No.3 Hal* (pp. 254–258). Universitas Negeri Makassar. https://doi.org/10.26858/jdm.v10i3.41846

Yang, Z., Yang, X., Wang, K., Zhang, Y., Pei, G., & Xu, B. (2021). The emergence of mathematical understanding: Connecting to the closest superordinate and convertible concepts. *Frontiers in Psychology*, *12*, 525493.

Yuwono, T., Supanggih, M., & Ferdiani, R. D. (2018). Analysis of mathematical problem solving abilities in solving word problems based on the Polya procedure. *Jurnal Tadris Matematika*, *1*(2), 137–144.